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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/840,089	TIN, SIU-KEI
	Examiner	Art Unit
	Yuzhen Ge	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 February 2008</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,2,4-13,15-24 and 26-33</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,2,4-13,15-24 and 26-33</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/ are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Examiner's Remark

Applicant's amendment, filed on Feb. 7 2008, has been received and entered into the file. The objections to specification and drawing have been overcome in view of applicant's amendments/remarks and are hereby withdrawn. Claims 3, 14, and 25 have been canceled. Claims 1-2, 4-13, 15-24, and 26-33 are pending.

Regarding applicant's argument that Lin is seen only to disclose clipping the projection of the color at the gamut boundary of a device and the gamut is not described being a human visual gamut, the examiner would like to point out that a device gamut is a human visual gamut according to the definition of a device gamut. A human visual gamut is a gamut/subspace in a color space with colors that human can visually distinguish or see the colors. A device gamut is a human visual gamut because a device gamut represents/contains colors that human can visually distinguish and see. A new reference by Vrhel et al is introduced to clarify this. Please refer to the definition of CIE XYZ color space and device dependent color space in Section II.A and II.B. The CIE XYZ color space values are obtained by sampling visible spectrum. A device dependent color space can map to the CIE space by a one-to-one mapping but not a on-to mapping. Furthermore, Fig. 4 of Lin et al also shows that a device dependent gamut is a human visual gamut.

On the other hand, even if the applicant does not agree that a device gamut is a human visual gamut, it is still obvious to map a device independent color value outside a human visual gamut to a boundary of the human visual gamut because a human visual gamut is a region in a color space. There are many patents and publications in the art such as the cited patent by Lin et

al and the non-patent literature paper by Vrhel et al that maps a region in a device independent

color space to another region by similar methods.

Therefore the 102 and 103 rejections of the pending claims are not overcome by

applicant's arguments and amendment.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   Claims 1-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. Claims 1, 12 and 23 recite "clipping a luminance component of the device-

independent color value to a non-negative value; determining whether or not the clipped device-

independent color value". There is insufficient antecedent basis for the limitation "a device-

independent color value with the clipped luminance component" in the claim. The examiner

would interpret the limitation as "clipping a luminance component of the device-independent

color value to a non-negative value; determining whether or not a device-independent color

value with the clipped luminance component" in the claim.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 1, 5, 11-12, 22-23, and 33 are rejected under 35 U.S.C. 102(b) as being

anticipated by Lin et al (US Patent 6,181,445).

Regarding claim 1, Lin et al teach a method of mapping a device dependent color value

depending on correcting a color value generated by a forward model for a color input device to a

device-independent color space, comprising;

converting the device dependent color value into a device-independent color value by

using a forward model of the color input device (col. 7, lines 19-36, the inverse function convert

from device dependent color values to a device-independent color value, col. 8, lines 4-21);

clipping a luminance component of the device-independent color value to a non-negative

value (Fig. 6B, point 144 is clipped to 145, point 141 to 142, col. 15, lines 46-61, also all values

of L* are non-negative which can be regarded as the result of clipping);

determining whether or not the clipped device-independent color value is outside a

human visual gamut (Figs. 6A-6B, the gamut 133 is a human visual gamut, see also Fig. 4,

device gamuts are inside of a visual spectrum by definition, col. 9, lines 57-65, col. 15, lines 46-

61, see also the definition of CIE XYZ color space and the paper by Vrhel et al); and

mapping the device-independent color value outside the human visual gamut to a

boundary of the human visual gamut based on the determination result (Figs. 6A-6B, point 144 is

clipped to 145, point 141 to 142, col. 15, lines 46-61).

Regarding claim 5, Lin et al teach the method of claim 1, wherein the mapping maps the clipped

device-independent color value outside the human visual gamut to an intersection between a line

defined by the clipped device-independent color value and a white point and the boundary of the

human visual gamut (the point on L* axis is the white point, Fig. 6A, the point 135 is the result

of mapping).

Regarding claim 11, Lin et al teach the method of claim 1, wherein the color space is CIELAB

(Figs. 3B, 5A-8, col. 10, lines 19-49, col. 11, lines 39-53).

Claims 12, 22 and 23, 33 are the corresponding system and computer readable medium claims of

claims 1 and 11. Lin et al teach a system (Figs. 1 and 12, col. 5, lines 17-28) and a computer

readable medium (col. 6, lines 21-41, Fig. 12). Thus Lin et al teach 12, 22 and 23, 33 as

evidently explained in the above-cited passages.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

5.   Claims 2, 4, 13, 15-16, 24, and 26-30 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lin et al in view of Hardeberg (US Patent 6,728,401), further in view of

Spaulding et al (US Patent 5,539,540).

Regarding claim 2, Lin et al teach the method of claim 1. However they do not explicitly teach

wherein clipping the luminance component sets the luminance component of the device-

independent color value which has a negative value and chromaticity components to zero. In the

same field of endeavor, Hardeberg teaches setting the luminance component of the device-

independent color value which has a negative value (col. 9, lines 26-31). By the definition of

luminance, it should be greater than or equal to 0. It may be small than 0 only when

mathematical derivation and approximation are used. When a luminance value is set to 0, then

the chromaticity components have no meaning and may as well be set to 0. Spaulding et al

further teach when luminance value is 0, the chromaticity components are also 0 (Figs. 3, 6, 20,

22 and 24). It is desirable to have the luminance values that correspond to real pixel values and

correct any error made during mathematical manipulations and estimations (col. 9, lines 1-31 of

Hardeberg). Therefore it would have been obvious to one of ordinary skill in the art, at the time

of invention, to set the luminance component of the device-independent color value which has a

negative value from some computations and chromaticity components to zero so that the pixel

values make sense.

Regarding claim 4, Lin et al, Hardeberg and Spaulding teach the method according to claim 2,

wherein the luminance component of the device-independent color value is not clipped at an

upper bound in the clipping (col. 16, lines 8-31, the white point is specified by the threshold and

the luminance is allowed to exceed the threshold value, Fig. 6B, point 141 to point 142, col. 15,

lines 46-61, e.g. luminance levels from 0 to 40 are clipped to 30-40).

All the limitations of system claims 13 and 15-16 are in the corresponding method of claims 2

and 4-5. All the limitations of computer readable medium claims 24 and 26-30 are in the

corresponding method claims of claims 2 and 4-8. Lin et al teach a system (Figs. 1 and 12, col. 5, lines 17-28) and a computer readable medium (col. 6, lines 21-41, Fig. 12). Thus Lin et al, Hardeberg and Spaulding et al teach Claims 13, 15-16, 24 and 26-30 as evidently explained in the above-cited passages.

1.   Claims 6-10, 17-21 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US Patent 6,181,445) in view of Beretta (US Patent 5,416,890).

Regarding claim 6, Lin et al teach the method of claim 2. However they do not explicitly teach wherein the boundary is the ISO standard CIE spectral locus on a chromaticity space. The CIE spectral locus can be considered as a gamut on a chromaticity space. Therefore the same method taught by Lin et al can be applied because the method of Lin et al does not constrain to any specific gamut. Beretta explicitly shows the ISO standard CIE spectral locus on a chromaticity space as a gamut or a subspace of a color space (Figs. 6-7 and 13-15A). It is desirable to reproduce color images (col. 1, lines 25-50 of Lin et al) and to broaden applications of the method taught by Lin et al to other gamut and it is desirable to have a system and method for color selection and color modification in the context of a uniform color model (col. 5, line 63-col. 6, line 40 of Beretta). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to apply the method of Lin et al to gamut whose boundary is the ISO standard CIE spectral locus on a chromaticity space as in the system and method of Beretta so that color selection and modification is done in a uniform color model.

Regarding claims 7, 8, 9, 10, Lin et al and Beretta teach the method of claims 1 and 6. However they do not explicitly teach wherein the chromaticity space is the CIE chromaticity xy plane/the CIE Uniform Chromaticity Scale (TICS) u'v' plane and the color space is CIEXYZ and CIELUV. Although Lin et al describe the method in CIELAB color space, the method can be applied to any color space or any independent color space such as CIEXYZ and CIELUV and the clipping method can be applied to any two dimensional space. Beretta further teach the CIE chromaticity xy plane/the CIE Uniform Chromaticity Scale (TICS) u'v' plane and color space CIEXYZ and CIELUV (col. 3, lines 21-32, Figs. 6-7 and 13-15A). It is desirable to broaden the application of the method of Lin et al and use an independent color space depending on the needs of the application. Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to apply the method of Lin et al to the chromaticity space which is the CIE chromaticity xy plane/the CIE Uniform Chromaticity Scale (TICS) u'v' plane and to the color space which is CIEXYZ and CIELUV.

Claims 17-21 and 31-32 are the corresponding system of claims 6-10 and computer readable medium claims of claims 9-10. Lin et al teach a system (Figs. 1 and 12, col. 5, lines 17-28) and a computer readable medium (col. 6, lines 21-41, Fig. 12). Thus Lin et al and Beretta teach Claims 17-21 and 31-32 as evidently explained in the above-cited passages.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuzhen Ge whose telephone number is 571-272 7636. The examiner can normally be reached on 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

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Yuzhen Ge
Examiner
Art Unit 2624

2/27/08

**WENPENG CHEN
PRIMARY EXAMINER**